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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/849,052	05/20/2004	Jong Jin Park	P25330	6744

7055 7590 11/29/2006

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RESTON, VA 20191

EXAMINER
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PETTITT, JOHN F

ART UNIT	PAPER NUMBER
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3744

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/849,052

Applicant(s)

PARK, JONG JIN

Examiner

John Pettitt

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>07/19/2005, 07/21/2006</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

**Claims 9-10, 13, and 19** are objected to because of the following informalities:

**In regard to claim 9**, the recitation "inserted into the outer surface of the cylinder" (line 3) is not supported by the specification and should read --inserted onto the outer surface of the cylinder--.

**In regard to claims 10, 13, and 19**, see claim 9 above.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi (Korean patent application No. 10-2003-0066151) in view of Weeks (US 4,842,287).

**In regard to claim 1**, Choi ('151) teaches a case (120 - Fig. 1) provided with a cold tip (350) at an end thereof; a cylinder (150) fixedly installed in the case (120) and provided with a piston (140) capable of reciprocating therein; a displacer (310) installed in the piston (140) such that the displacer (310) can reciprocate; a regenerator (330) positioned between the displacer (310) and the cold tip (350); a heat exchanger (200) connected to the regenerator (330) and the cylinder (150). Choi ('151) does not explicitly teach a packing (interpreted as a gasket, O-ring, or other elastic material

Art Unit: 3744

employed for sealing mating parts) positioned in an area in which the cylinder contacts the case (120).

However, as taught by Weeks ('287), gaskets and O-rings are the most common means of sealing pressurized devices such as Stirling coolers (column 1, lines 10-23) and therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to employ a gasket between the cylinder flange and the mating case step portion (Fig. 1) as taught by Weeks ('287), in the Choi ('151) Stirling cooler for the purpose of providing a more complete seal for the Stirling cooler than the bolted flange alone.

**In regard to claim 2**, Choi ('151) teaches that the heat exchanger (200) includes an inner heat exchanger (210) installed in a heat exchange chamber positioned between the cylinder (150) and the case (120), and an outer heat exchanger (220) installed on an outer surface of the case (120) opposite to the inner heat exchanger (210). The combination of Choi ('151) and Weeks ('287) discussed for claim 1 results in the packing (gasket) being positioned at the heat exchange chamber and capable of sealing the heat exchange chamber.

**In regard to claim 3**, Choi ('151) teaches that an O-ring (156 - Fig. 2) is installed at an outer surface of the cylinder (150) opposite to the inner heat exchanger (210).

**In regard to claim 4**, Choi ('151) teaches that an O-ring (156) is installed at a portion of the cylinder (150) contacting the case (120) in a radial direction of the cylinder (150).

**In regard to claim 5**, the combination of Choi ('151) and Weeks ('287) discussed above in claim 4 teaches that the O-ring and the packing are respectively positioned at opposite sides of the heat exchange chamber in the axial direction of the cylinder.

**In regard to claim 6**, see claim 1.

**In regard to claim 7**, as the cylinder (150) of Choi ('151) is cylindrical, the cylinder flange of Choi ('151) has a ring shape.

**In regard to claim 8**, it is common in the art for a packing (gasket) to have through holes when the packing is positioned between bolted surfaces. This allows the bolts to pass through the packing (gasket) and ensures that the flange need not be extended to position the packing (gasket).

**In regard to claim 9**, the packing (gasket) of the combination discussed for claim 6 would have a ring shape because it is inserted onto the outer surface of the cylinder between the cylinder flange and the case stair (both of which are cylindrical and thus ring shaped surfaces).

**In regard to claim 10**, the packing (gasket) of the combination discussed for claim 6 would inherently have a radius for defining a distance from the center thereof to the outer circumference thereof because the cylinder flange is cylindrical. In addition, it would have been obvious, at the time the invention was made, for the radius of the packing (gasket) to be the same as a radial distance from the center of the cylinder (150) to the flange of the cylinder because the cylinder flange cooperates with the packing (gasket), the stair of the case, and the bolts to seal the Stirling cooler.

**In regard to claim 11**, see claims 1-2.

**In regard to claim 12, see claim 8.**

**In regard to claim 13, see claim 9.**

**In regard to claim 14, see claim 3.**

**In regard to claim 15, see claim 4.**

**In regard to claim 16, see claim 5.**

**In regard to claim 17, see claims 11 and 15.**

**In regard to claim 18, see claim 8.**

**In regard to claim 19, see claim 13.**

**In regard to claim 20, see claim 14.**

Art Unit: 3744

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Pettitt whose telephone number is 571-272-0771. The examiner can normally be reached on M-F 8a-4p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JFP III  
November 20, 2006

  
CHERYL TYLER  
SUPERVISORY PATENT EXAMINER